**Unit 3 Map (Cells – The Basic Unit of Life)**

Ms. Ottolini, AP Biology

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| **Topic** | **Objective** (with College Board Essential Knowledge’s in Parentheses) | **Specific Learning Target** | **Where did I learn this?**  (What resources should I use to study?) | **How well do I know this?**  (scale of 1 to 3, with 3 indicating a high level of understanding) |
| Cell Membrane Structure | 1. You will be able to describe the chemical composition of the cell membrane and discuss how the structure of the membrane relates to its selective permeability. | a. You will be able to describe the organization of phospholipid molecules in the membrane bilayer and explain why they arrange themselves this way based on their chemical properties. |  |  |
| b. You will be able to connect the structure of the lipid bilayer with the semi-permeable nature of the cell membrane. |  |  |
| c. You will be able to evaluate the role of membrane proteins in transport of substances across the cell membrane, cell-cell recognition, etc. |  |  |
| d. You will be able to describe how the structure and properties of the membrane gave it the name “fluid mosaic model.” |  |  |
| Cell Transport | 2. You will be able to compare / contrast the main types of transport across the membrane – diffusion, osmosis, and active transport. | a. You will be able to compare and contrast passive vs. active transport. |  |  |
| b. You will be able to connect passive vs. active transport to concepts of free energy (from the biochemistry unit). |  |  |
| c. You will be able to compare and contrast simple diffusion vs. facilitated diffusion and provide examples of each in real cells. |  |  |
| d. You will be able to predict the direction of water movement during osmosis based on the concentrations of solute and water in two adjacent solutions |  |  |
| e. You will be able to provide examples of various active transport strategies in real cells. |  |  |
| Calculations – Water Potential and Cell Size (Surface Area to Volume Ratio) | 3. You will be able to apply mathematics to predict a cell’s osmotic potential and the efficiency of cell transport based on a cell’s surface area to volume ratio. | a. You will be able to predict the movement of water based on water potential calculations. |  |  |
| b. You will be able to calculate surface area to volume ratios for various cell shapes and determine which cell has the highest efficiency from a group of cells with different shapes and sizes. |  |  |
| c. You will be able to describe various strategies within different cell types for increasing surface area to volume ration and improving the efficiency of cell transport (ex: microvilli in small intestinal cells). |  |  |
| Cell Types and Cell Structure | 4. You will be able to compare the structures found in various cell types and connect the function of a cell to its unique structural features. | a. You will be able to compare and contrast prokaryotic vs. eukaryotic cells and explain (based on their structure) why eukaryotic cells can be larger than prokaryotic cells. |  |  |
| b. You will be able to summarize the theory of endosymbiosis and provide pieces of evidence from real cells / organelles to support this theory. |  |  |
| c. You will be able to describe the compartmentalization (dividing) of the eukaryotic cell into various cell parts (organelles) with distinct functions. |  |  |
| d. You will be able to describe the movement of cell products (ex: proteins) through the endomembrane system to their eventual expulsion from the cell via exocytosis. |  |  |